OIPE SC106
JAN 28 2005
PATENT & TRADEMARK OFFICE

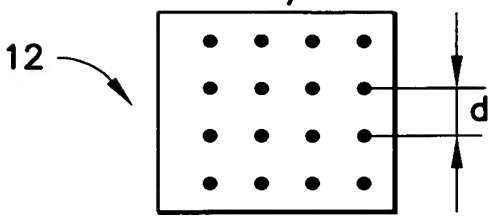

FIG. 1A
PRIOR ART

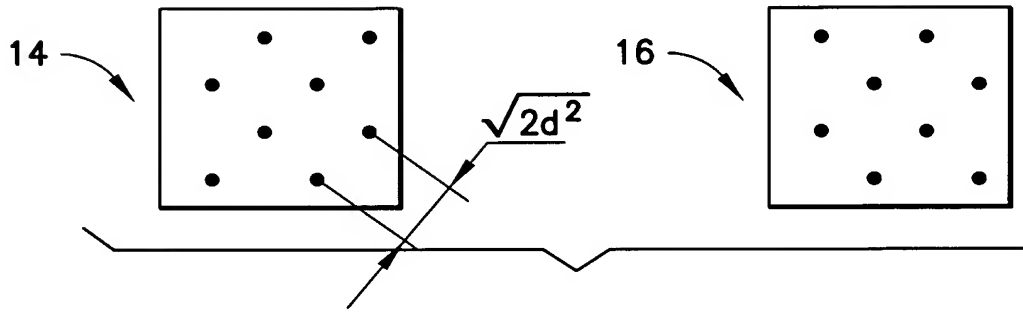

FIG. 1B
PRIOR ART

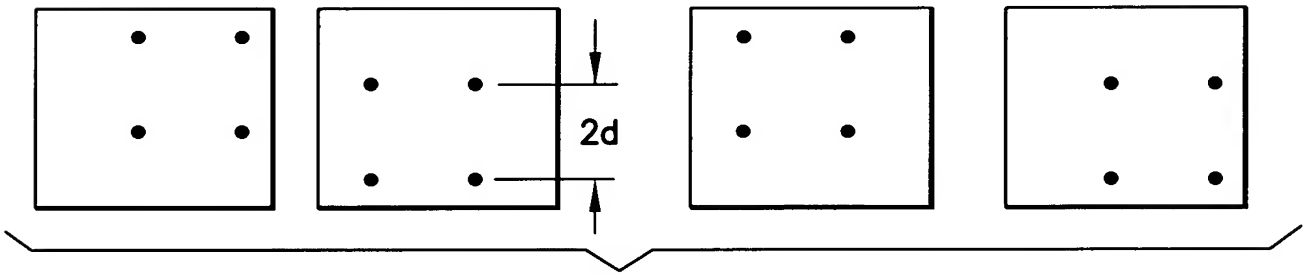

FIG. 1C
PRIOR ART

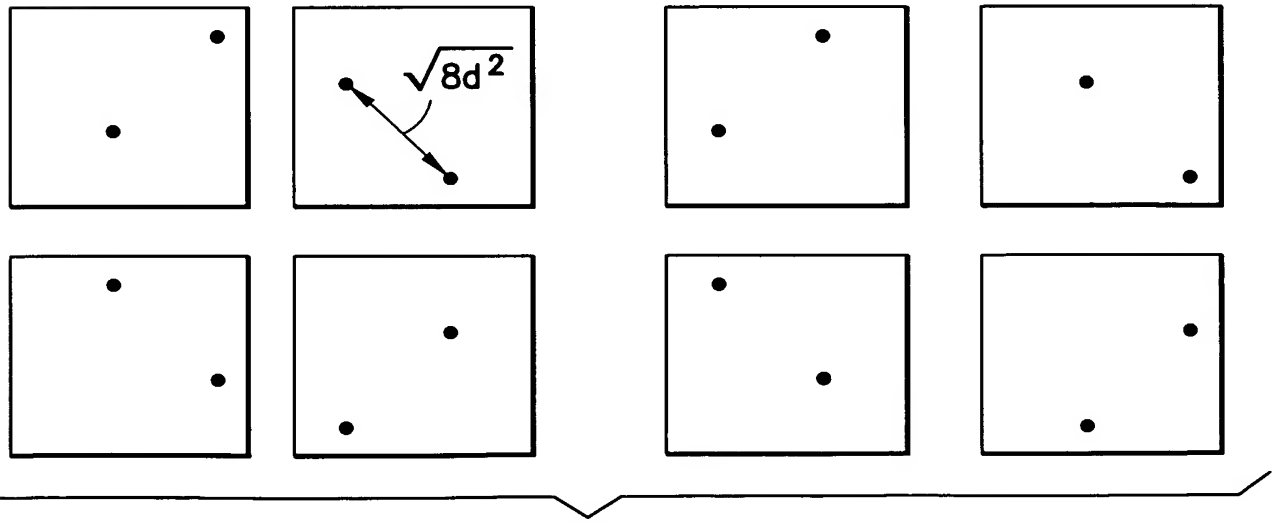

FIG. 1D
PRIOR ART

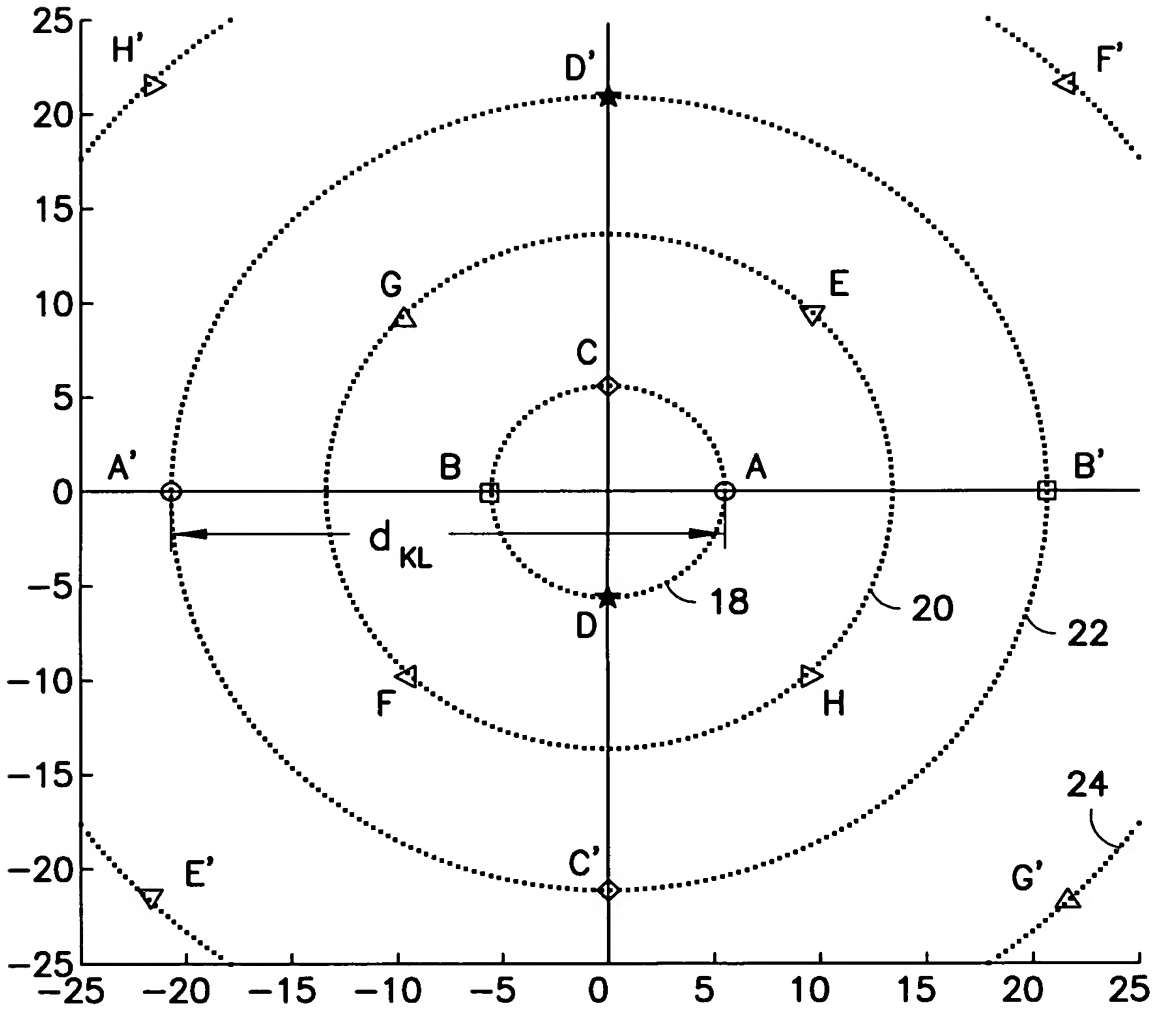
25
20
15
10
5
0
−5
−10
−15
−20
−25
−25 −20 −15 −10 −5 0 5 10 15 20 25
H'
D'
F'
G
E
C
A'
B
A
B'
d KL
18
20
22
D
F
H
24
E'
C'
G'

FIG.2

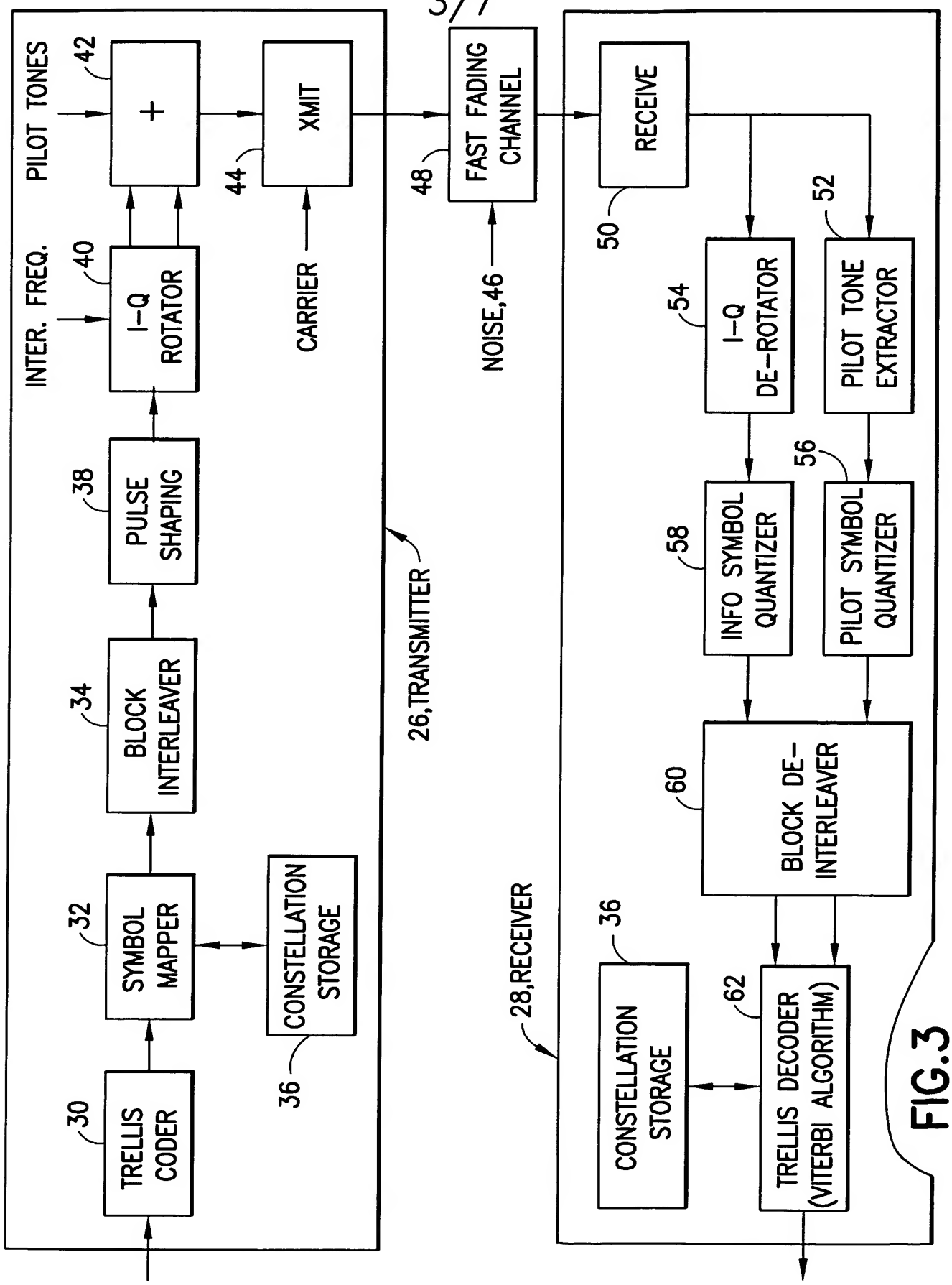
TRELLIS CODER
30
SYMBOL MAPPER
32
CONSTELLATION STORAGE
36
BLOCK INTERLEAVER
34
PULSE SHAPING
38
I-Q ROTATOR
40
INTER. FREQ.
PILOT TONES
+
42
XMIT
44
CARRIER
26,TRANSMITTER
FAST FADING CHANNEL
48
NOISE,46
RECEIVE
50
I-Q DE-ROTATOR
54
PILOT TONE EXTRACTOR
52
INFO SYMBOL QUANTIZER
58
PILOT SYMBOL QUANTIZER
56
BLOCK DE-INTERLEAVER
60
28,RECEIVER
CONSTELLATION STORAGE
36
TRELLIS DECODER (VITERBI ALGORITHM)
62

FIG.3

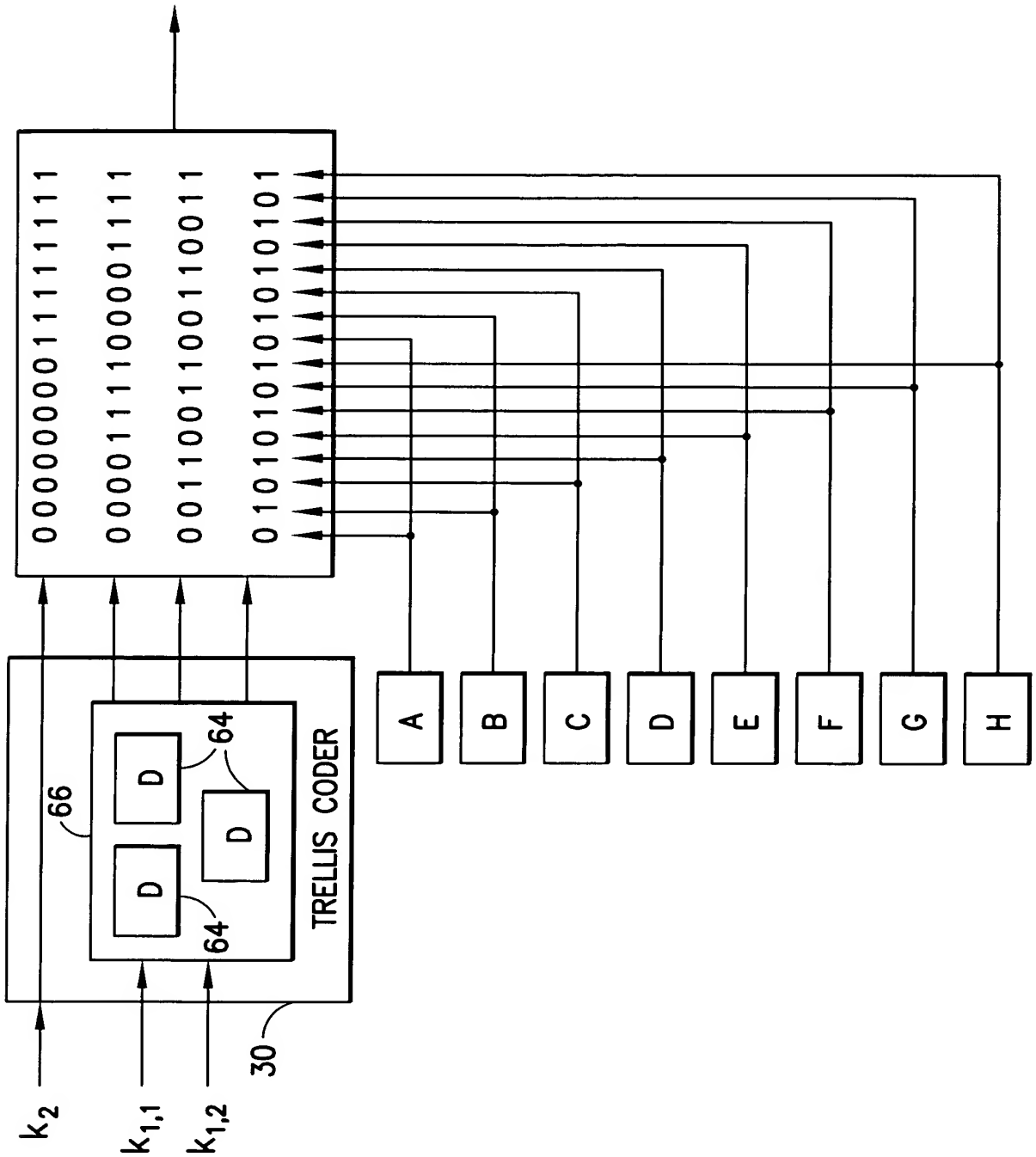
0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1
0 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1
0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1
0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1
A
B
C
D
E
F
G
H
TRELLIS CODER
D
D
D
64
64
66
30
k_2
$k_{1,1}$
$k_{1,2}$

FIG.4

OCTAL TRANSFER FUNCTION: [1 4 2; 4 3 0]

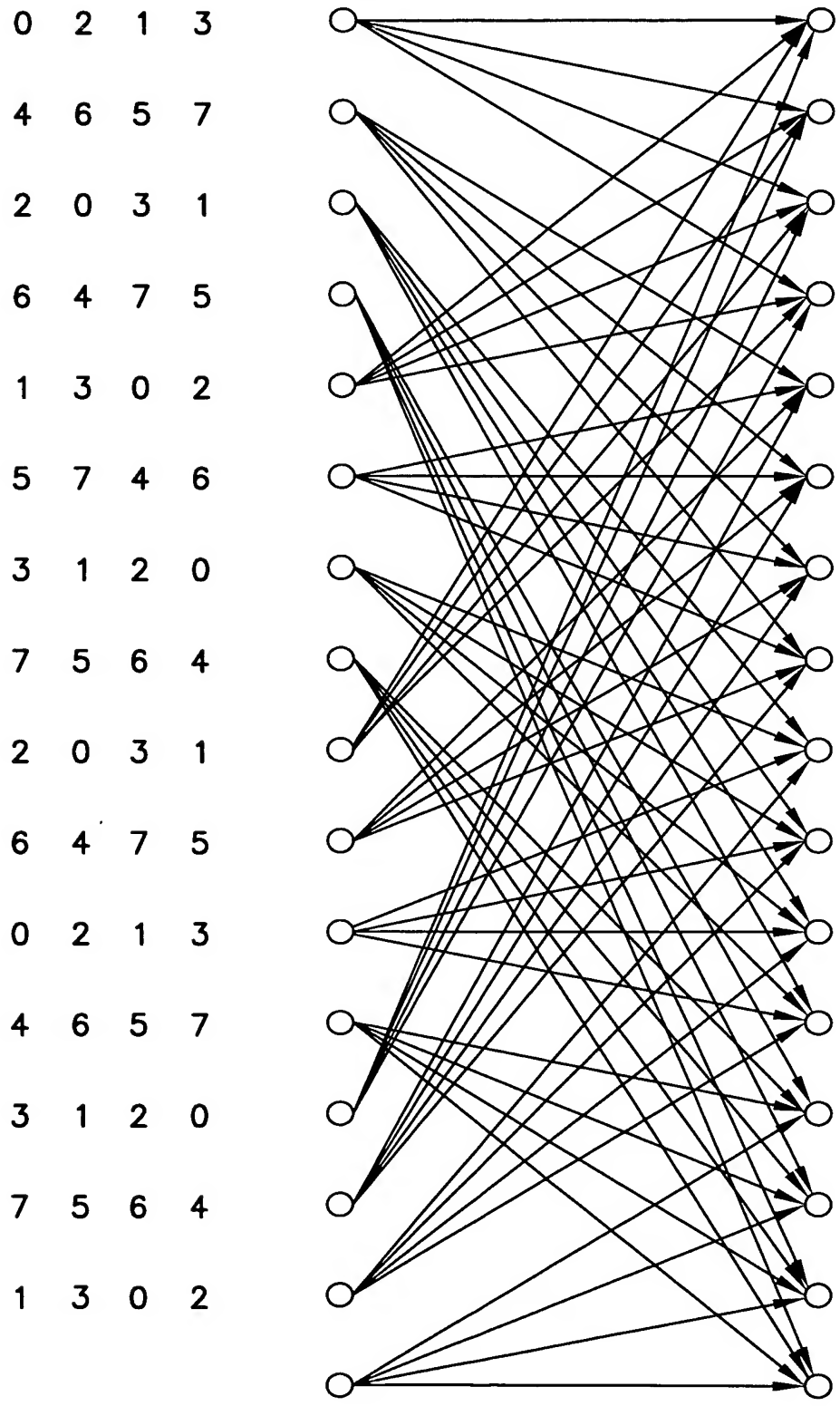

FIG.5

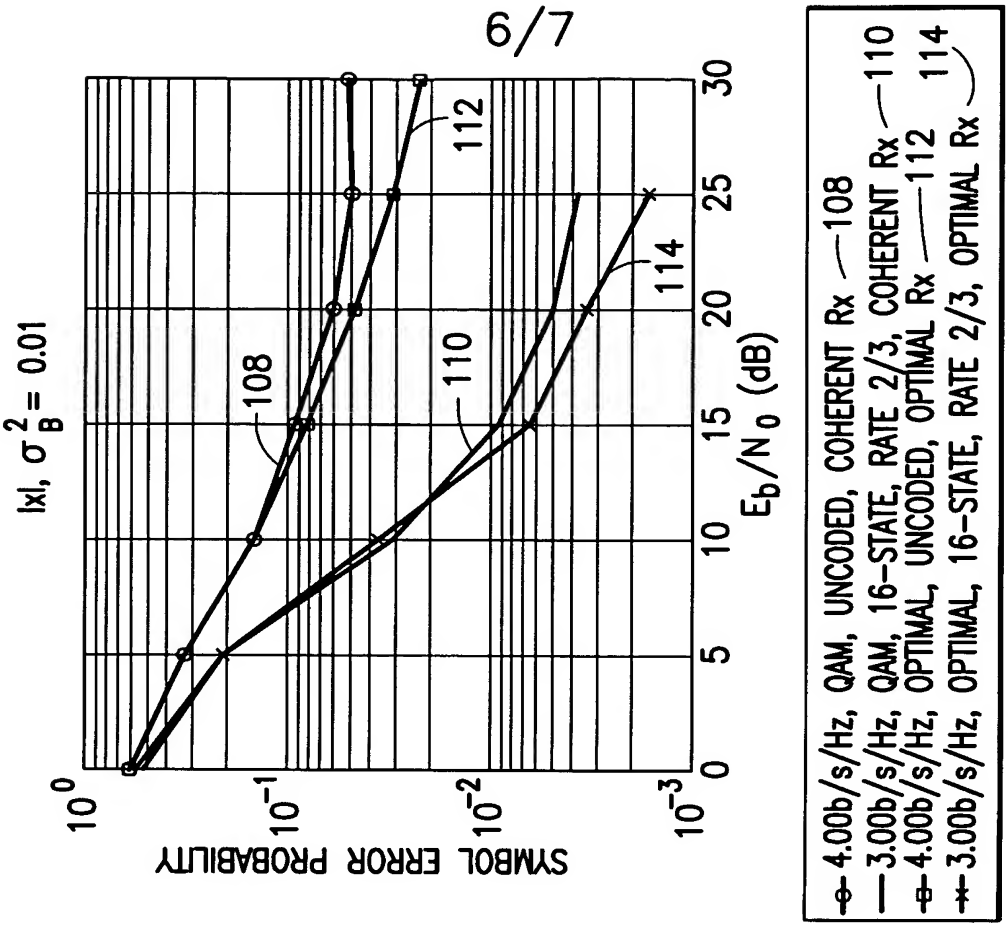
|x|, σ_B^2= 0.01
SYMBOL ERROR PROBABILITY
E_b/N_0 (dB)
108
110
112
114
4.00b/s/Hz, QAM, UNCODED, COHERENT Rx —108
3.00b/s/Hz, QAM, 16-STATE, RATE 2/3, COHERENT Rx —110
4.00b/s/Hz, OPTIMAL, UNCODED, OPTIMAL Rx —112
3.00b/s/Hz, OPTIMAL, 16-STATE, RATE 2/3, OPTIMAL Rx —114

FIG.6B

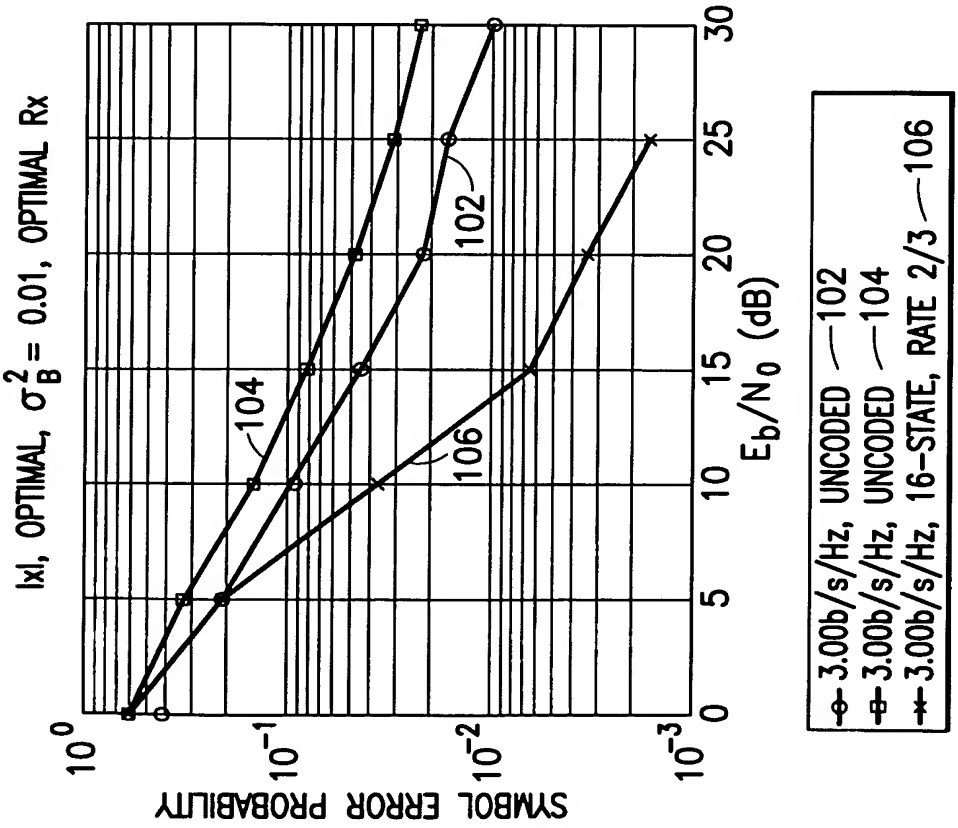
|x|, OPTIMAL, σ_B^2= 0.01, OPTIMAL Rx
SYMBOL ERROR PROBABILITY
E_b/N_0 (dB)
102
104
106
3.00b/s/Hz, UNCODED —102
3.00b/s/Hz, UNCODED —104
3.00b/s/Hz, 16-STATE, RATE 2/3 —106

FIG.6A

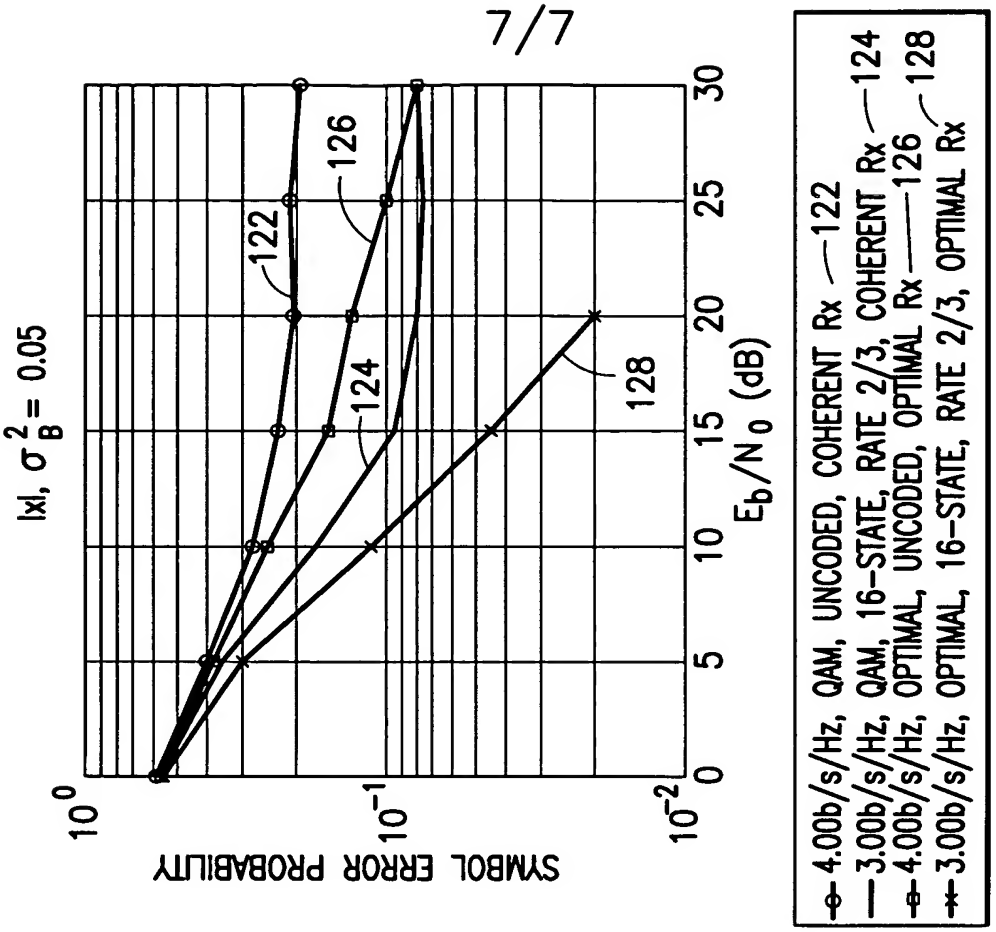
|x|, σ_B^2= 0.05
SYMBOL ERROR PROBABILITY
10^0
10^{-1}
10^{-2}
0
5
10
15
20
25
30
E_b/N_0 (dB)
122
126
124
128
4.00b/s/Hz, QAM, UNCODED, COHERENT Rx —122
3.00b/s/Hz, QAM, 16-STATE, RATE 2/3, COHERENT Rx —124
4.00b/s/Hz, OPTIMAL, UNCODED, OPTIMAL Rx —126
3.00b/s/Hz, OPTIMAL, 16-STATE, RATE 2/3, OPTIMAL Rx —128

FIG.7B

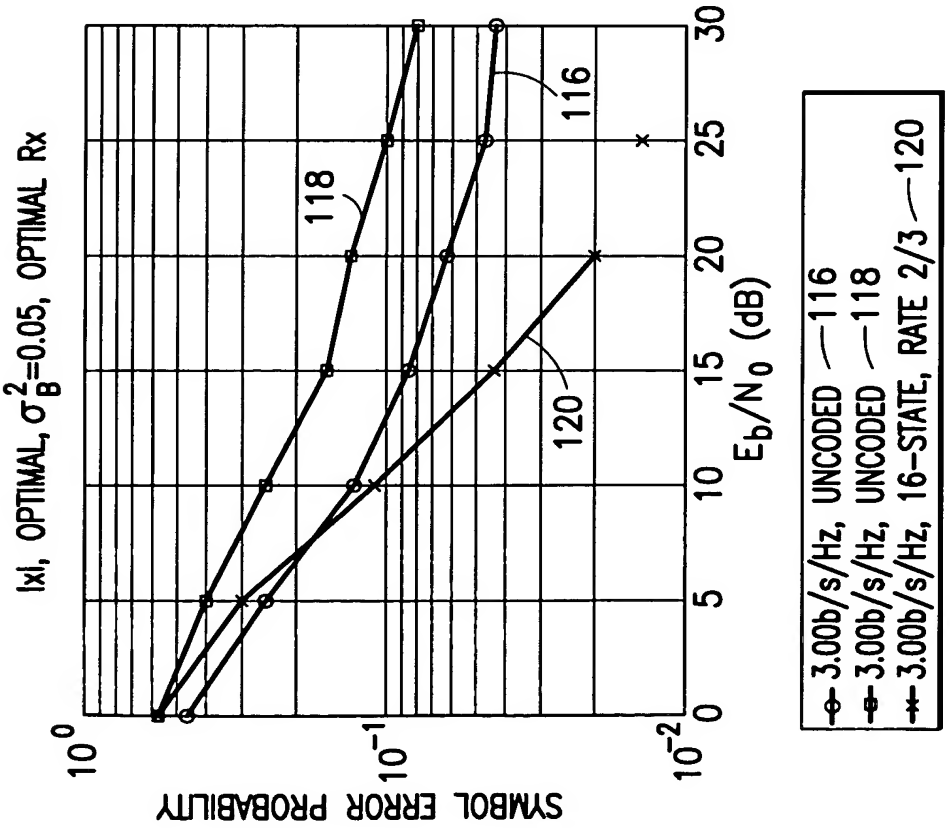
|x|, OPTIMAL, σ_B^2=0.05, OPTIMAL Rx
SYMBOL ERROR PROBABILITY
10^0
10^{-1}
10^{-2}
0
5
10
15
20
25
30
E_b/N_0 (dB)
118
116
120
3.00b/s/Hz, UNCODED —116
3.00b/s/Hz, UNCODED —118
3.00b/s/Hz, 16-STATE, RATE 2/3 —120

FIG.7A